§ 174.050 Stability on bottom.

Each bottom bearing unit must be designed so that, while supported on the sea bottom with footings or a mat, it continually exerts a downward force on each footing or the mat when subjected to the forces of wave and current and to wind blowing at the velocities described in § 174.055(b)(3).

§ 174.055 Calculation of wind heeling moment (Hm).

(a) The wind heeling moment (Hm) of a unit in a given normal operating condition or severe storm condition is the sum of the individual wind heeling moments (H) calculated for each of the exposed surfaces on the unit; *i.e.*, Hm=Σ H.

(b) Each wind heeling moment (H) must be calculated using the equation:

$$H=k(v)^2(Ch)(Cs)(A)(h)$$

where—

(1) H=wind heeling moment for an exposed surface on the unit in foot-pounds (kilogram-meters);
(2) k=0.00338 lb./(ft.^{2}-knots^2) (0.0623 (kg-sec^2)/m^4);
(3) v=wind velocity of—
(i) 70 knots (36 meters per second) for normal operating conditions.
(ii) 100 knots (51.5 meters per second) for severe storm conditions.
(iii) 50 knots (25.8 meters per second) for damage conditions.
(4) A=projected area in square feet (squrae meters) of an exposed surface on the unit;
(5) Ch=height coefficient for ''A'' from Table 174.055(a);
(6) Cs=shape coefficient for ''A'' from Table 174.055(b); and
(7) h=the vertical distance in feet (meters) from the center of lateral resistance of the underwater hull to the center of wind pressure on ''A''.

(c) When calculating ''A'' in the equation described in paragraph (b) of this section—

(1) The projected area of each column or leg; if the unit has columns or legs, must not include shielding allowances;

(2) Each area exposed as a result of heel must be included;

(3) The projected area of a cluster of deck houses may be used instead of the projected area of each individual deck house in the cluster; and

(4) The projected area of open truss work may be calculated by taking 30% of the projected areas of both the front and back sides of the open truss work rather than by determining the projected area of each structural member of the truss work.

TABLE 174.055(a)—CH VALUES

Feet		Meters		Ch.
Over	Not exceeding	Over	Not exceeding	
0	50	0.0	15.3	1.00
50	100	15.3	30.5	1.10
100	150	30.5	46.0	1.20
150	200	46.0	61.0	1.30
200	250	61.0	76.0	1.37
250	300	76.0	91.5	1.43
300	350	91.5	106.5	1.48
350	400	106.5	2.0	1.52
400	450	122.0	137.0	1.56
450	500	137.0	152.5	1.60
500	550	152.5	167.5	1.63
550	600	167.5	183.0	1.67
600	650	183.0	198.0	1.70
650	700	198.0	213.5	1.72
700	750	213.5	228.5	1.75
750	800	228.5	244.0	1.77
800	850	244.0	256.0	1.79
Above 850		Above 256		1.80

NOTE: The ''Ch'' value in this table, used in the equation described in section § 174.055(b), corresponds to the value of the vertical distance in feet (meters) from the water surface at the design draft of the unit to the center of area of the ''A'' value used in the equation.

TABLE 174.055(b)—CS VALUES

Shape	Cs.
Cylindrical shapes	0.5
Hull (surface type)	1.0
Deckhouse	1.0
Cluster of deckhouses	1.1
Isolated structural shapes (cranes, angles, channels, beams, etc.)	1.5
Under deck areas (smooth surfaces)	1.0
Under deck areas (exposed beams and girders)	1.3
Rig derrick (each face and open truss works)	1.25

NOTE: The ''Cs'' value in this table, used in the equation described in § 174.055(b), corresponds to the shape of the projected ''A'' in the equation.

§ 174.065 Damage stability requirements.

(a) Each unit must be designed so that, while in each of its normal operating conditions and severe storm conditions, its final equilibrium waterline would remain below the lowest edge of any opening through which additional flooding could occur if the unit were subjected simultaneously to—

(1) Damage causing flooding described in §§ 174.075 through 174.085; and

(2) A wind heeling moment calculated in accordance with § 174.055(b) using a wind velocity of 50 knots (25.8 meters per second).

(b) Each unit must have a means to close off each pipe, ventilation system, and trunk in each compartment described in §174.080 or §174.085 if any portion of the pipe, ventilation system, or trunk is within 5 feet (1.5 meters) of the hull.

§174.070 General damage stability assumptions.

For the purpose of determining compliance with §174.065, the assumptions are made that during flooding and the resulting change in the unit's waterline—

(a) The unit is not anchored or moored; and

(b) No compartment on the unit is ballasted or pumped out to compensate for the flooding described in §§174.075 through 174.085.

§174.075 Compartments assumed flooded: general.

The individual flooding of each of the compartments described in §§174.080 and 174.085 must be assumed for the purpose of determining compliance with §174.065 (a). Simultaneous flooding of more than one compartment must be assumed only when indicated in §§174.080 and 174.085.

§174.080 Flooding on self-elevating and surface type units.

(a) On a surface type unit or self-elevating unit, all compartments within 5 feet (1.5 meters) of the hull of the unit between two adjacent main watertight bulkheads, the bottom shell, and the uppermost continuous deck or first superstructure deck where superstructures are fitted must be assumed to be subject to simultaneous flooding.

(b) On the mat of a self-elevating unit, all compartments of the mat must be assumed to be subject to individual flooding.

§174.085 Flooding on column stabilized units.

(a) Watertight compartments that are outboard of, or traversed by, a plane which connects the vertical centerlines of the columns on the periphery of the unit, and within 5 feet (1.5 meters) of an outer surface of a column or footing on the periphery of the unit, must be assumed to be subject to flooding as follows:

(1) When a column is subdivided into watertight compartments by horizontal watertight flats, all compartments in the column within 5 feet (1.5 meters) of the unit's waterline before damage causing flooding must be assumed to be subject to simultaneous flooding.

(2) When a column is subdivided into watertight compartments by vertical watertight bulkheads, each two adjacent compartments must be assumed subject to simultaneous flooding if the distance between the vertical watertight bulkheads, measured at the column periphery, is equal to or less than one-eighth of the column perimeter at the draft under consideration.

(3) When a column is subdivided into watertight compartments by horizontal watertight flats and vertical watertight bulkheads, those compartments that are within the bounds described in paragraph (a)(2) of this section and within 5 feet (1.5 meters) of the unit's waterline before damage causing flooding must be assumed to be subject to simultaneous flooding.

(b) Each compartment in a footing must be assumed to be subject to individual flooding when any part of the compartment is within 5 feet (1.5 meters) of the unit's waterline before damage causing flooding.

§174.090 Permeability of spaces.

When doing the calculations required in §174.065—

(a) The permeability of a floodable space, other than a machinery space, must be as listed in Table 174.090; and

(b) Calculations in which a machinery space is treated as a floodable space must be based on an assumed machinery space permeability of 85%, unless the use of an assumed permeability of less than 85% is justified in detail.

TABLE 174.090—PERMEABILITY

Spaces and tanks	Permeability (percent)
Storeroom spaces	60.
Accommodation spaces	95.
Voids	95.
Consumable liquid tanks	95 or 0.[1]
Other liquid tanks	95 or 0.[2]

[1] Whichever results in the more disabling condition.